

J. Engelman. Instructions for the Collection and Treservation of Botanical Specimens. In gathering plants you will do well to pay atten tion to all the plants you come across, whether showy or unsightly. To not neglect the latter on account of their appearance. bollect if possible several specimens of the same plant, partly to show different states of the same species, and partly to beable to distribute them among different to tamists. To not be deterred from gathering the same Species at different places and seasons. If may prove not to be the very same species, but only an allied once species; or even if identical it is interesting for the study of geographical bota my to have the same species from distant localities. On the whole collect only such plands as you find in flower or fruit, but trees and thrubs ought to form an escept tion, as also smaller plants, if they afford some particular interest, other by their medicinal or other properties, great preponderance in certain districts, ite. The most important part of the plant is the flower and fruit, Get if possible such specimens as present by both states, flower and fruit, or both on different specimen You will find plants which have fertile and sterile flowers textines they occur either on the same plant, as in the oaks, hickories, etc., or on different plants, as in the willows, cottonwoods and other In both cases it is important to collect specimens which show lach of them. the oaks, redbuds and many others. In these the flowers must be preserved, and later in the season, the leaves with the fruits; but great care must be taken to get them from the same species. If the specimen you obtain is not too large, gather wen tire, with the root or at least with part of it, so as to show the na ture of that organ. Try to have the lower as well as upper leaves complete on the specimen, especially if they should differ from MISSOURI

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In case the specimen is too large for a sheet of paper, say more than 17 inches high, it may still be preserved entire, by bending or rather breaking (without entirely severing its the parts) the sten to branches or leaves may also be treated in the same manner. It AMISTONES I better than cutting it in different segments, at the these might become separated and much confusion ensue from i This cause. Of still larger plands, Shrubs, trees, it is oxily possible as to take only a part, a branch, etc; but if there should be differed a leaves on the plant, it will be necessary to out offsuch leaves with a small perce of stem attached, and preserve them with the other specimens. 4 who Make the specimen large enough to present a fair sample of the plant, its manner of growth, ramification etc. It will be well to put your specimens in paper assoon as gathered; Their parts are then fresh and stiff and are easy by spread out in a neat way; but if they become flaceis is They present much difficulty, and the dried specimens will a * Large flawers specimens with thick stems or hooks [bulls especially) or even very clumsy works flowers [as large this the heads often require to be split lengthways, so as to make them less bulky and injurious to the other plants in the herbarion, Large fruits may be also split, or they may be preserved to In putting up the specimens, spread them out in such a manner that all the different parts are seen, and the flawers, a ver some of the flowers, are laid open. If, however, time as wanting as the plant may be laid in the paper just as it is. The object of pressing plants, being to keep all the parts Spread out smooth, and free from shrinking and winkling, but not to crush the more delicate organs, the flowers especia pressure should be moderate, say from 25 MISSOURI cm copyright reserved

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the organs, that they may afterwards be examined. In traveling the two boards tightly strapped together will be quite sufficient to pres, plants. At home any weight from of 30 or 40 pounds will do the same service. After the specimen has been but in paper and pressed, they have become damp from moisture absorbed from the plans He and to substitute dry ones for them. This ought to be repeated er daily till the specimen is completely dried. The most convenient method is to but the specimen I in finer paper, say printing paper, then a layer of 2, 4 or 6 Sheeds of coarser bibulous paper, then a finer sheet with a plant and so forth. In changing the plants dry layers are sul Stituted for the moist ones without removing the execumen from The finer sheet immediately louching it, which would be a testion as Job, often injuring the specimen. The damp layers are then hung up or spread out and dried. The dried specimens are put I aside between single leaves or sheets of paper, as many in one Sheet as may be put there joithout injuring each other. When you have got a sufficiently sized bundle together, pack iteither in a box of convenient size or in a phin of some animal to [hair inside] which will harden and shrink and form an easily handled and safe package, A specimen is of much less value if not properly ved labeled. Therefore as soon as collected or when put up, attach a perce of people to it, the most simple method is to stick the stem through a hole in the papers) on which you note at least date and locality, but if possible also every thing you can ascertain ing about the plant and which does not appear in the dried speci men itself: colour of flower, taste, smell, time of opening and es closing of flowers, size of the plant, height, diameter of star (in trees); noture of the soil (ewamp, sand, rocks, open pla us ces, shade, etc. I whether frequent or rare, In regrasition

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Besides this it will be well to number your plants as you collect them. This number will stand for a name and can always be referred to, especially if you keep a Journal or some other memoranda of your collections, or in correse pondance with your other botanists, to whom specimens may be communicated. You will further materially advance our know ledge of the vegetable king down, if you could collect any parts of plants or products of plants, which may be va-valuable or cirious, such as medicinal roots, barks, Junis Make it an especial object to collect the fruits of plants which cannot be preserved in the herbarium, such as pinecones, muss and others. Get also specimens of thenvoids, Of stems not thicker than I inches in diameter, take a whole perice 19 inches long, of larger ones only a section of the ster, showing bark. alburrum sesterior soft wood sand. hard interior wood. All such specimens of fruits, woods, roots, may very conveniently be bedared labeled and marked with the Dame numbers as the specimens for of the plant from which they se derved. Collect also ripe seeds as many as you can get. Preserve them in their pools or fruits as they keep longer fresh keep in them. In wrapping them up, put if possible, a few leaves a small branch, flowers or whatever part you can get, with them, and number them with the same number as the dried Specimen of the same plant. lose their power to begetate if too old. They ought to be packed dry but not two tight, as they may sufficable and moulder. MISSOURI

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I have more esperally studied I pay feartioular attention to deveral families to which I wish to direct your particular attention. Amention the Asolepiadeae and Emphorbiaceae, both comprising plants with milky since, the first mostly with showy, umbellated flowers and silky appendage to the numerous seeds, the other with very inconspicuous greenish flower and I seeds. Further the Times - then all the parasites such as the Cuscutae (Todder or Lovevine) and the Species of Viscum which grow on trees (Misletoe) some Say Hamael great interest on Pines in the Pacific regions Above all others Imention the Cactus tribe, which I have not only studied, but also cultivated. Specimens of Cacti in flower and in fruit are important as well as entire plants, especially living ones for cultivation. For the herbarium the flower must be preserved with a perice of the plant attached to it, which shows the ridges or tubercles and spines, In your labels do not forget to describe the shape of the entire plant, nun ber of ribs, number, shape, direction and color of spines meach bunch. The bacti are easily propagated by seed, and also living plants may be kept very long from 6 to 12 months); they must be kept dry and not packed too close, nor before they have been kept for some time whithering, or they will rot. Joung plants are preserved better than old ones in this manner. ones in this manner. I have found The most convenient apparatus for drying plants in traveling is the following. Stitch or paste 2 or 3 sheets of coarse of the brown paper at their backs, and string about 20 or 25 of such layers on one string, each fastened own about one inch from the next. But them in a strong passesboard portfolio, and put several of these partfolios in a press of two perces of plank, Strapped together lightly. The strings of layers whe



again without loss of time. Finis MISSOURI BOTANICAL GARDEN GEORGE ENGELMANN PAPERS MISSOURI BOTANICAL GARDEN